

09/364,423

Second Reply to Final Rejection of September 10, 2003

Reply dated May 18, 2004

AMENDMENTS TO THE CLAIMS:**Claim 1 (Previously Presented):**

A liquid crystal display device comprising

a first transparent substrate and a second transparent substrate arranged to confront each other, and

a liquid crystal component layer sealed between said first transparent substrate and said second transparent substrate,

said first transparent substrate being provided with

a transparent insulating substrate,

a plurality of scan lines,

a plurality of signal lines provided perpendicularly to each of said scan lines,

a plurality of pixels arranged in matrix form surrounded by said scan lines and said signal lines,

a plurality of common electrodes provided substantially parallel at both sides of said signal lines,

pixel electrodes provided between said common electrodes at each of said pixels,

switching elements connected to said signal lines that individually control electric fields applied to said pixel electrodes of said pixels,

common lines that supply a prescribed electric potential to said common electrodes,

09/364,423

Second Reply to Final Rejection of September 10, 2003

Reply dated May 18, 2004

a first alignment layer formed on the highest layer of said first transparent substrate,

a second alignment layer formed on the highest layer of said second transparent substrate,

said signal lines including adjacent regions, said signal lines and said adjacent regions defining signal line regions, and

said pixels including apertures, said apertures and a part of said pixel electrodes defining pixel aperture regions,

alignment direction of said first alignment layer at said signal line regions differing from alignment direction of said first alignment layer at said pixel aperture regions, and

alignment direction of said second alignment layer at said signal line regions differing from alignment direction of said second alignment layer at said pixel aperture regions.

Claim 2 (Original): A liquid crystal display device according to claim 1, wherein,

said liquid crystal component has a positive dielectric constant anisotropy, and wherein the alignment process of said signal line regions of said first alignment layer and said second alignment layer is carried out in a direction substantially orthogonal to the longitudinal direction of said pixel electrodes.

09/364,423

Second Reply to Final Rejection of September 10, 2003

Reply dated May 18, 2004

Claim 3 (Withdrawn): A liquid crystal display device according to claim 1, wherein,

said liquid crystal component has a negative dielectric constant anisotropy, and wherein the alignment process of said signal line regions of said first alignment layer and said second alignment layer is carried out in a direction approximately parallel to the longitudinal direction of said pixel electrodes.

Claim 4 (Withdrawn): A liquid crystal display device according to claim 1 wherein, said liquid crystal component has a negative dielectric constant anisotropy, and the alignment of said signal line regions of said first alignment layer and said second alignment layer is a vertical alignment.

Claim 5 (Original): A liquid crystal display device according to claim 1 wherein an alignment process is carried out such that the alignment of said pixel aperture region of said first alignment layer and said second alignment layer has an inclination of any angle θ that is neither orthogonal nor parallel to the longitudinal direction of said pixel electrode.

Claim 6 (Original): A liquid crystal display device according to claim 2 wherein an alignment process is carried out such that the alignment of said pixel aperture regions of said first alignment layer and said second alignment layer has an inclination of any angle θ that is neither orthogonal nor parallel to the longitudinal direction of said pixel electrodes.

09/364,423

Second Reply to Final Rejection of September 10, 2003

Reply dated May 18, 2004

Claim 7 (Withdrawn): A liquid crystal display device according to claim 3 wherein an alignment process is carried out such that the alignment of said pixel aperture regions of said first alignment layer and said second alignment layer has an inclination of any angle θ that is neither orthogonal nor parallel to the longitudinal direction of said pixel electrodes.

Claim 8 (Withdrawn): A liquid crystal display device according to claim 4 wherein an alignment process is carried out such that the alignment of said pixel aperture regions of said first alignment layer and said second alignment layer has an inclination of any angle θ that is neither orthogonal nor parallel to the longitudinal direction of said pixel electrodes.

Claim 9 (Previously amended): A liquid crystal display device according to claim 2 wherein said first alignment layer and said second alignment layer are alignment layers that can be aligned by light, and are processed by polarized light such that each of said signal line regions and said pixel aperture regions of these alignment layers undergoes a controlled alignment process.

Claim 10 (Withdrawn): A liquid crystal display device according to claim 3 wherein said first alignment layer and said second alignment layer are alignment layers that can be aligned by light, and are processed by polarized light such that each of said signal line regions and said pixel aperture regions of these alignment layers undergoes a stipulated alignment process.

09/364,423

Second Reply to Final Rejection of September 10, 2003

Reply dated May 18, 2004

Claim 11 (Withdrawn): A liquid crystal display device according to claim 4 wherein said first alignment layer and said second alignment layer are alignment layers that can be aligned by light, and are processed by polarized light such that each of said signal line regions and said pixel aperture regions of these alignment layers undergoes a stipulated alignment process.

Claim 12 (Original): A liquid crystal display device according to claim 2 wherein the alignment process of regions other than said signal line regions and said pixel aperture regions of said first alignment layer and said second alignment layer is the same alignment process as either the alignment process of said signal line regions or the alignment process of said pixel aperture regions.

Claim 13 (Withdrawn): A liquid crystal display device according to claim 3 wherein the alignment process of regions other than said signal line regions and said pixel aperture regions of said first alignment layer and said second alignment layer is the same alignment process as either the alignment process of said signal line regions or the alignment process of said pixel aperture regions.

Claim 14 (Withdrawn): A liquid crystal display device according to claim 4 wherein the alignment process of regions other than said signal line regions and said pixel aperture regions of said first alignment layer and said second alignment layer is the same alignment process as either the alignment process of said signal line regions or the alignment process of said pixel aperture regions.

09/364,423

Second Reply to Final Rejection of September 10, 2003

Reply dated May 18, 2004

Claim 15 (Original): A liquid crystal display device according to claim 5 wherein the alignment process of regions other than said signal line regions and said pixel aperture regions of said first alignment layer and said second alignment layer is the same alignment process as either the alignment process of said signal line regions or the alignment process of said pixel aperture regions.

Claim 16 (Original): A liquid crystal display device according to claim 2 wherein said pixel electrodes and said signal lines both extend over said common electrodes with an insulating film, are parallel to said common electrodes, and are separated from each other.

Claim 17 (Withdrawn): A liquid crystal display device according to claim 3 wherein said pixel electrodes and said signal lines both extend over said common electrodes with an insulating film, are parallel to said common electrodes, and are separated from each other.

Claim 18 (Withdrawn): A liquid crystal display device according to claim 4 wherein said pixel electrodes and said signal lines both extend over said common electrodes with an insulating film, are parallel to said common electrodes, and are separated from each other.

Claim 19 (Original): A liquid crystal display device according to claim 5 wherein said pixel electrodes and said signal lines both extend over said common

09/364,423

Second Reply to Final Rejection of September 10, 2003

Reply dated May 18, 2004

electrodes with an insulating film, are parallel to said common electrodes, and are separated from each other.

Claim 20 (Original): A liquid crystal display device according to claim 2 wherein said common electrodes and said pixel electrodes extend parallel to each other and separated from each other; and said signal lines extend parallel to said common electrodes and over said common electrodes and said pixel electrodes with an insulating film.

Claim 21 (Withdrawn): A liquid crystal display device according to claim 3 wherein said common electrodes and said pixel electrodes extend parallel to each other and separated from each other; and said signal lines extend parallel to said common electrodes and over said common electrodes and said pixel electrodes with an insulating film.

Claim 22 (Withdrawn): A liquid crystal display device according to claim 4 wherein said common electrodes and said pixel electrodes extend parallel to each other and separated from each other; and said signal lines extend parallel to said common electrodes and over said common electrodes and said pixel electrodes with an insulating film.

09/364,423

Second Reply to Final Rejection of September 10, 2003

Reply dated May 18, 2004

Claim 23 (Original): A liquid crystal display device according to claim 5 wherein said common electrodes and said pixel electrodes extend parallel to each other and separated from each other; and said signal lines extend parallel to said connection electrodes and over said common electrodes and said pixel electrodes with an insulating film.

Claim 24 (Previously presented): A liquid crystal display device comprising

- a first transparent substrate and
- a second transparent substrate arranged to confront each other, and
- a liquid crystal component layer sealed between said first transparent substrate and said second transparent substrate,

said first transparent substrate being provided with:

- a transparent insulating substrate,
- pixel electrodes and common electrodes substantially parallel and alternately arranged on said transparent insulating substrate,
- a plurality of pixels arranged in matrix form,
- scan lines and switching elements that individually control electric fields applied to pixel electrodes of said pixels,
- signal lines connected to said switching elements, said signal lines including adjacent regions, said signal lines and said adjacent regions defining signal line regions,

09/364,423

Second Reply to Final Rejection of September 10, 2003

Reply dated May 18, 2004

common lines that supply a prescribed electric potential to common electrodes of said pixels and a first alignment layer formed on the highest layer; and

said second transparent substrate being provided with:

at least a second alignment layer on the highest layer, and a light-shielding layer having aperture regions of said pixels below said alignment layer,

said liquid crystal component having a positive dielectric constant anisotropy,

said first alignment layer and said second alignment layer undergoing an alignment process so as to have an inclination of any angle θ which is neither parallel nor orthogonal to the longitudinal direction of said pixel electrode,

said light-shielding layer being formed from a conductor and

voltage is applied to said light-shielding layer such that the direction of liquid crystal molecules within said liquid crystal component layer in said signal line regions is aligned substantially perpendicular to said first transparent substrate.

Claim 25 (Original): A liquid crystal display device according to claim 24 wherein voltage impressed to said light-shielding layer is either a direct-current voltage of a potential within a range of 10—20 V higher, or within a range of 10—20 V lower, than the average value of the potential of said signal lines, or an alternating voltage of a long period.

09/364,423

Second Reply to Final Rejection of September 10, 2003

Reply dated May 18, 2004

Claim 26 (Original): A liquid crystal display device according to claim 24 wherein said pixel electrodes and said signal lines extend over said common electrodes with an insulating layer, are parallel to said common electrodes, and separated from each other.

Claim 27 (Original): A liquid crystal display device according to claim 24 wherein said common electrodes and said pixel electrodes extend parallel and separated from each other, and said signal lines extend parallel to said common electrodes over said common electrodes and said pixel electrodes with an interposed insulating layer.